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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,619	12/10/2001	Paul L. Frattini	060825-0306US	4759
24341 7590 07/12/2007 MORGAN, LEWIS & BOCKIUS, LLP. 2 PALO ALTO SQUARE 3000 EL CAMINO REAL PALO ALTO, CA 94306			EXAMINER PALABRICA, RICARDO J	
			ART UNIT 3663	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/014,619

Applicant(s)

FRATTINI ET AL.

Examiner

Rick Palabrica

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 21-35 and 37-40 is/are pending in the application.
- 4a) Of the above claim(s) 23,27 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21, 22, 24, 26, 29-35 and 37-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. Applicant's 5/15/07 Amendment, which directly amended claims 30, 33, 34, 35, 38 and 40, and traversed the rejection of claims in a previous examiner's 12/15/06 Office action, is acknowledged.

The current examiner has considered applicant's arguments with respect to the rejected claims, but said arguments are moot in view of the new ground(s) of rejection.

### *Drawings*

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the plurality of transducers positioned along the entire length of the housing (e.g., see claims 24, 26 and 38) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

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consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 21, 22, 29, 31, 32, 37, and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by John, Jr. et al. (U.S. 4,966,177) or McNeer (U.S. 4,071,376) or Fields et al. (U.S. 4,372,787) or Minoru et al. (JP 9220545), who each disclose an ultrasonic cleaning apparatus

John, Jr. et al.

As to claim 21, applicant's claim language reads on John, Jr. et al. as follows: a) "elongated housing" reads on cleaning tank receptacle 48 (see Fig. 3 and col. 4, lines 52+); b) "plurality of ultrasonic omnidirectional transducers" reads on the plurality of transducers 46 positioned on housing 48 (see Fig. 5 and col. 4, lines 44+).

John, Jr. et al.'s ultrasonic transducers 46 inherently emanate omnidirectional ultrasonic energy waves because the sound waves generated are omnidirectional, i.e., they are emitted in all directions. Such omnidirectional emission of energy from the transducers of John, Jr. et al. cannot be prevented. (Examiner's note: See Reference U for evidence that sound waves in an ultrasonic transducer are omnidirectional).

The claims are directed to an apparatus and NOT to a process. However, the claims are replete with statements that are either essentially method limitations or statements of intended or desired use. For example, "for cleaning an irradiated nuclear fuel assembly", "to be at least as long as an irradiated nuclear fuel assembly to be received by said elongated housing," "to emanate omnidirectional ultrasonic energy waves having anode structure that is an approximate multiple of a spacing between fuel rods", etc. These clauses, as well as other statements of intended use do not serve to patently distinguish the claimed structure over that of the reference, as long as the structure of the cited references is capable of performing the intended use. See MPEP 2111-2115.

See also MPEP 2114 that states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531.

[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528.

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

As to claims 22 and 29, for example, John, Jr. et al.'s housing is capable of receiving an irradiated BWR nuclear fuel assembly comprising an array of cylindrical rods. Applicant has not defined the term, "fuel assembly". Absent such definition the examiner interprets the term broadly and reads it on a disassembled fuel assembly that comprises a plurality of fuel rods. Note that irradiated fuel assemblies are sometimes disassembled into its constituent fuel rods that are then consolidated into a spent fuel canister. Consolidation of fuel rods is advantageous because it reduces the volume of spent fuel to be stored (see, for example, McDaniels (U.S. 5,098,644) or Ellingson (U.S. 5,000,906)). Fig. 3 in John, Jr. shows such plurality of fuel rods from an assembly.

As to claims 31, 32, 37, and 39, the limitation, "to emanate omnidirectional ultrasonic energy waves having a node structure that is an approximate multiple of a spacing between fuel rods", is a method limitation or a statement of intended or desired use. The claim is directed to an apparatus and NOT to a process. The structural elements of an apparatus are the physical elements present at the time the apparatus is taken off-the-shelf or removed from the shipping or storage container. In the instant application, the structural elements of the apparatus in the claim are: a) a housing with an opening; and b) a plurality of transducers positioned on the housing. The above-cited limitation on node structure is transitory and occurs when the claimed apparatus is turned on. Only at that time, i.e., during operation, do the transducers then generate

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energy waves. This process limitation does not patentably distinguish the claimed apparatus from the applied art, as explained above.

If applicant would argue that the limitation regarding the node structure is NOT a method limitation or a statement of intended or desired use, which argument would have no basis, then the claims are still rejectable at least under 37 CFR 112, second paragraph. Claims 31 and 37 recite in the preamble the subcombination of a device, whereas the body is directed to the combination of the device and the irradiated nuclear fuel. The preamble does NOT positively recite, "irradiated nuclear fuel assembly" as an element of the device because as part of a, intended or desired use clause. The body of the claim, on the other hand, positively recites the irradiated nuclear fuel assembly via the "multiple spacing between fuel rods." This inconsistency between the preamble and the body of the claim presents the question as to whether the claim recites a combination or subcombination. Additionally, there is insufficient antecedent basis for the limitation that is directed to the combination rather than to the subcombination because not all devices with a housing and transducers inherently include an irradiated nuclear fuel assembly.

Clearly, John, Jr. et al. is capable of being used in the same manner and for the intended or desired use as the claimed invention. Note that it is sufficient to show that said capability exists, which is the case for the cited reference.

McNeer

As to claim 21, applicant's claim language reads on McNeer as follows (see Figs. 1-4): a) "elongated housing" reads on cylinder 12; b) "plurality of ultrasonic

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omnidirectional transducers" reads on the plurality of ultrasonic transducers 18. These transducers, which are attached to sealed ring 20, are positioned directly on cylinder 12 when the ring is at the bottom of the cylinder, e.g., prior to filling the cylinder with liquid. The transducers are also positioned indirectly on cylinder 12 (i.e., through the liquid medium) when the cylinder is being filled with liquid. Note that applicant recites the term "positioned on said housing" broadly and the examiner reads the term on either or both direct and indirect positioning of McNeer's transducers.

McNeer's ultrasonic transducers 18 inherently emanate omnidirectional ultrasonic energy waves because the sound waves generated are omnidirectional, i.e., they are emitted in all directions. Such omnidirectional emission of energy from the transducers of McNeer cannot be prevented.

As to claims 22 and 29, McNeer's apparatus can be configured to ultrasonically clean spent BWR fuel assemblies, instead of a cask, and is therefore capable of being used in the same manner and for the intended or desired use as the claimed invention. Note that it is sufficient to show that said capability exists, which is the case for the cited reference. See discussion above on method limitations and statements of intended or desired use.

As to claims 31, 32, 37, and 39, McNeer is capable of meeting the limitations in these claims. See similar discussion on John, Jr. et al. above.

Fields et al.

As to claim 21, applicant's claim language reads on Fields et al. as follows (see Figs. 1-5): a) "elongated housing" reads on housing 12 having outer wall 14 and inner



wall 16; b) "plurality of ultrasonic omnidirectional transducers" reads on the plurality of ultrasonic transducers 34 (see Fig. 3 and claim 1(b)). These transducers are positioned on housing 12 (see Fig. 3)

Fields et al.'s ultrasonic transducers 34 inherently emanate omnidirectional ultrasonic energy waves because the sound waves generated are omnidirectional, i.e., they are emitted in all directions. Such omnidirectional emission of energy from the transducers of Fields et al. cannot be prevented.

As to claims 22 and 29, Fields et al. device can be configured to ultrasonically clean spent BWR fuel assemblies and is therefore capable of being used in the same manner and for the intended or desired use as the claimed invention. Note that it is sufficient to show that said capability exists, which is the case for the cited reference.

As to claims 31, 32, 37, and 39, Fields et al. is capable of meeting the limitations in these claims. See similar discussion on John, Jr. et al. above.

Minoru et al.

As to claim 21, applicant's claim language reads on Minoru et al. as follows (see Fig.: a) "elongated housing" reads on cleaning tank 2; b) "plurality of ultrasonic omnidirectional transducers" reads on the plurality of ultrasonic oscillators 4, 5 and 6 that are positioned on tank 2.

Minoru et al.'s transducers 4, 5 and 6 are omnidirectional ultrasonic transducers.

As to claims 22 and 29, Minoru et al. 's device can be configured to ultrasonically clean spent BWR fuel assemblies and is therefore capable of being used in the same

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manner and for the intended or desired use as the claimed invention. Note that it is sufficient to show that said capability exists, which is the case for the cited reference.

As to claims 31, 32, 37, and 39, Minoru et al. is capable of meeting the limitations in these claims. See similar discussion on John, Jr. et al. above.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 30, 33, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over any one of John, Jr. et al. or McNeer or Fields et al. or Minoru et al. in view of Kato et al. (U.S. 5,467,791) or Richardson et al. (U.S. 5,377,237), either alone or in combination.

Any one of John, Jr. et al. or McNeer or Fields et al. or Minoru et al. disclose the applicant's claim limitations except for the reflector.

Kato et al. teach an ultrasonic cleaning device for a nuclear fuel assembly (see Abstract and Figs. 1-12). They further teach the use of a reflector 131 around the housing 127 of the apparatus to prevent leakage of ultrasonic waves (see col. 10, lines 25+).

Richardson et al. teach a method and apparatus for ultrasonic inspection of a tube component of a nuclear reactor (see col. 1, lines 1+, and Fig. 2). They utilize an air

gap as an efficient reflector of ultrasound (see col. 2, lines 64+). They further teach how to create this air gap by a mechanical seal 20 (see col. 2, lines 60+ and Fig. 2).

One having ordinary skill in the art at the time of the invention would have recognized that the primary and secondary references are in the same field of endeavor, i.e., application of ultrasonics.

It would also have been obvious to such artisan to use with the system of John, Jr. et al. or McNeer or Fields et al. or Minoru et al., an inner reflector around the housing, by the teaching of Kato et al., to gain the advantage thereof, e.g., reduce leakage of ultrasonic waves, and further an air gap around said inner reflector, by the teaching Richardson et al., to further gain the advantage thereof, e.g., further reduce wave leakage, because such modifications are no more than the use of well known expedients within the art. As to the outer reflector, this is inherent in the modification based on Richardson et al. because said outer reflector must be present to have an air gap around the inner reflector.

5. Claims 24 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over any one of John, Jr. et al. or McNeer or Fields et al. or Minoru et al.

Positioning the plurality of transducers along the entirety of the length of the housing in any one of the above references is a matter of optimization within prior art conditions or through routine experimentation (see MPEP 2144.05 II.A). Such configuration of the transducer positions would ensure that the entire length of the fuel

assembly is exposed to ultrasonic cleaning, and therefore optimize the utilization of the plurality of transducers.

6. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over any one of John, Jr. et al. or McNeer or Fields et al. or Minoru et al. in view of in view of Walter et (U.S. 5,200,666). Any one of John, Jr. et al. or McNeer or Fields et al. or Minoru et al. disclose the applicant's claim limitations except for a first and second transducers, and the positioning of the transducers along the entire length of the housing.

Walter et al. teach in Fig. 1 a transducer comprising an elongated rod having a length that is an integral multiple of  $\frac{1}{2}$  a predetermined wavelength (see column 1, lines 54+). They also teach that their invention can emit twice the amount of ultrasonic energy compared to other transducers with the same geometric dimensions (see column 2, lines 1+).

As to claim 25, one having ordinary skill in the art at the time of the invention would have recognized that both references are in the same field of endeavor, i.e., ultrasonic generators for ultrasonic cleaning.

It would also have been obvious to such artisan to use in the system, as disclosed by any one of John, Jr. et al. or McNeer or Fields et al. or Minoru et al., the transducers taught by Walter et al., to gain the advantages thereof (i.e., more effective and efficient ultrasonic wave generation), because such modification is no more than the use of a well known expedient within the art.

As to the deployment of the transducers along the entire length of the housing, this is a matter of optimization. See section 5 above.

7. Claims 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minoru et al. in view of Kato et al. (U.S. 5,467,791) or Richardson et al. (U.S. 5,377,237), either alone or in combination. Minoru et al. disclose the applicant's claim limitations except for the reflector, and the extension and orientation of the transducers along the longitudinal direction.

Minoru et al. teach the use of four ultrasonic transducers (see Fig.).

The limitation on the transducer extension along a predetermined longitudinal direction and their orientation relative to said direction, are matters of design and/or optimization within prior art conditions or through routine experimentation (see MPEP 2144.05 II.A). The disposition of transducers parallel to the longitudinal direction would have been obvious to one having ordinary skill in the art at the time of the claimed invention, where the spent fuel element has a cylindrical configuration. The distribution along a predetermined length along the housing and positioning parallel to the longitudinal direction is a matter of optimization, e.g., finding the extent of disposition of the transducers that results in maximum cleaning at the lowest cost (i.e., fewest number of transducers)

As to the phrase, "such that each one of said at least four pluralities ..." in claim 34, the term, "such that" connotes a condition arising as a direct consequence or result of the immediately preceding structure or step recited. Thus, Minoru et al. in view of

Kato et al. or Richardson inherently meets this limitation because either combination meets the preceding structure of "each one of said at least four pluralities is positioned on said elongated housing."

8. Claims 21, 22, 29, 31, 32, 37, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over any one of John, Jr. et al. or McNeer or Fields et al. in view of Hilbert (Metal Finishing, April 1997).

In section 3 above, the examiner stated that the transducers of John, Jr. et al. or McNeer or Fields et al. are inherently generate omnidirectional energy waves. If this is not apparent to the applicant, then Hilbert teaches that ultrasonic transducers based on sound (which is the case for John, Jr. et al. or McNeer or Fields et al. ) are omnidirectional (see page 54, col. 2, 1<sup>st</sup> full paragraph).

9. The examiner's rejection of the claims based on the cited combination of elements of the prior art is consistent with the recent Supreme Court decision on *KSR Int'l Co. v. Teleflex, Inc.*, No. 04-1350 (U.S. Apr. 30, 2007). The Court rejected a rigid application of the "teaching, suggestion, or motivation" (TSM) test, which required a showing of some teaching, suggestion, or motivation in the prior art that would lead one of ordinary skill in the art to combine the prior art elements in the manner claimed in the application or patent before holding the claimed subject matter to be obvious.


***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:00-4:30, Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RJP  
July 2, 2007

  
RICARDO J. PALABRICA  
PRIMARY EXAMINER